

Construction of Water Storages in South India: A Critical Analysis through Historical Perspective

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Abstract

India is a country with very profound historical roots and strong cultural behaviour. These are reflected in its social structure and institutions of community life. Some of the traditions, evolved and developed thousands of years ago have played an important role in different spheres of life. One of the important among these is the tradition of collecting, storing and preserving water for various uses. As the population increased, settlements developed into towns and cities and agriculture expanded, techniques were developed to augment water availability by collecting and storing rain water, tapping hill and underground springs and water from snow and glacier melt etc. Water came to be regarded as precious and its conservation and preservation was sanctified by religion. Various religious, cultural and social rituals prescribed, inter alia, purification and cleansing with water. Hence, the paper deals with the construction of water storages in South India in ancient period. Tamil Nadu was the pioneer in this work, where the South India's first huge water storage was constructed. The Sangama king Karikala Chola constructed the South India's first reservoir to the Kaveri River which named as Kallanai reservoir. 1200 labourers worked in the construction. Who were captured by Karikala Chola from Silon. In order to adequate supply of water to agriculture the monarchy started the digging of water storages. The monarchy imposed irrigation tax on farmers that is why it was the mainly responsible for the construction of lake, reservoirs and well etc. the techniques of the

construction were very natural. Natural mounds, mountains were used as embankments to the reservoirs. And particular trees were planted on around the bank of the reservoir to give strength against the floods. These reservoirs are survived till today and we using the water from the same. Apart from the State reservoirs were constructed by individuals, village communities and temple committees.

Key Words:- South India, Reservoir, Irrigation, Construction, Monarchy.

Introduction

In India water harvesting has been practised since time immemorial. References of this practice are found in ancient religions texts and history. Archaeological evidence of elaborate water storage and supply systems are found for periods dating back to the Indus Valley Civilization (3000-1500 B.C.) to as recent as 19th century A.D. During the last about 100 years, the objectives and focus of water harvesting has undergone considerable change through the basic techniques of

design and construction has remained almost the same. The construction of water storage has been noted since proto-historical period. It is in vogue among the people now also. If we see it in the historical view, the credit of initiating the construction of water storage (reservoirs, lake, tanks, ponds etc.) is goes to Tamil Nadu. The scope of the present paper is confined to 9th century to 16th century. And mainly, few selected rulers like Pallava Mahendravarma I, Kakatiya ruler Ganapatideva, Kulottunga Rajendrachola II, Kadamba Jayaasimhadeva and Vijayanagara Shri Krishnadevaraya were mentioned in the paper as great contributors to the construction of water storages. The Sangama king Karikala Chola constructed the south India's first reservoir to the Kaveri River with 1080 feet long which was named as Kallanai reservoir. Karikala Chola constructed this reservoir by the 1200 labourers, who were imprisoned in the Silon invasion of Karikala Chola. The main reason for constructing the water storages was to promote agricultural

production. India is a play ground of Monsoon wind.

Sometimes the wind fails to pour the rain. It causes to reduction of agricultural production. Indian empires' economy or treasury was mainly based on land tax. So it insisted the kings to develop the agriculture. That is why the construction of water storages was highly essential. In this context many reservoirs, lakes, wells were constructed. These were also helped to home use also like drinking, bath etc. even today also people using the water of lake or tanks for drinking and home use in most regions. The State had taken main portion of responsibility in the construction the reservoirs. Not only was the state responsible to construct the water storages. Private individuals, village communities and temple committees also worked as an agency in the construction of water storages. Because of Water had been many applications in different rituals. Development of reliable sources of water like, storage reservoirs, ponds, lakes, irrigation canals etc. came to be regarded as an essential part of good

governance. Emperors and Kings not only built various water bodies but also encouraged the village communities and individuals to build these on their own. Wide-ranging laws were made to regulate their construction, maintenance and for conservation and preservation of water and its proper distribution and use.

Objectives

- To know the techniques of water storage construction and its maintenance.
- To reveal the main reasons for the construction of reservoirs.
- To know who constructed the water storages in their limits.

Methodology

In the present paper the researcher pursued analytical and exploration methods by using the primary sources like inscriptions and literary works. Ancient Indian religious texts and epics give a good insight into the water storage and conservation systems prevailing in those days. For instance the sage Narad during his visits to different kingdoms would

invariably enquire about the state of the ponds and other water bodies and whether these had enough water for the population. In the epic Ramayana, the beauty and grandeur of the kingdom of Lanka is described interalia, in terms of its well-maintained lakes, ponds, wells, gardens, orchards and forests.

Historical Perspective

In India, the first major human settlements came up in the Indus Valley (3000 - 1500 B.C.) in the north and western India. Evidence of water systems is found in different writings of this period. There are archaeological evidence of irrigation and drinking water supply systems from a large number of wells with brick lining. Dholavira, an important site of Indus Valley had several reservoirs to collect rain water. Similar evidences are found at Mohanjodaro and Harappa. In Lothal (Gujarat) and Inamgaon (Maharashtra) and other places in north and western India small bunds were built by the local people to store rain water for irrigation and drinking. The Arthashastra of Kautilya gives an extensive account of dams and bunds

that were built for irrigation during the period of the Mauryan Empire. (321–185 B.C.) The water supply systems were well managed within the framework of strict rules and regulations. Different types of taxes were collected from the cultivators depending upon the nature of irrigation. The tax rate was 25% of the produce in respect of water drawn from natural sources like rivers, tanks and springs. For water drawn from storages built by the King the tax rate varied according to the method of drawing water. For instance, it was 20% of the produce for water drawn manually, 25% for water drawn by bullocks and 33% for that diverted through channels. Exemptions from payment of water rates were given for building or improving irrigation facilities. The period of exemption was 5 years for new tanks and bunds, 4 years for renovating old works and 3 years for clearing the works overgrown with weeds. Water bodies like reservoirs, bunds and tanks were also privately owned and the owner was free to sell or mortgage them. The owner could also sell water to others in return for a share of the produce. In the

absence of the owner, the water bodies were to be maintained by the people of the village. A set of punishments were prescribed for various violations of water laws like: i) Death penalty was prescribed for breaking a reservoir or tank full of water ii) Selling or mortgaging a water body meant for charitable purposes. iii) Building a well or a tank on someone else's land. iv) Out-of-turn drawing of water from a tank. v) Failure to maintain the water body. vi) Causing damage to another's ploughed or sown field by letting water overflow from a tank/reservoir, etc.,.

Development during 1st Century B.C. to 15 Century A.D

Satvahanas (1st Century B.C. – 2nd Century A.D.) introduced the brick and ring wells. Lake and well irrigation was developed on a large scale during the time of Pandya, Chera and Chola dynasties in south India (1st – 3rd Century A.D.) and large structures were built across Cauvery and Vaigai rivers. Irrigation tanks were built, many of these by developing large natural depressions. Water resources development on a large scale

took place during the Gupta era (300-500 A.D.). In the south, the Pallavas expanded the irrigation system in the 7th Century A.D. The famous Cauvery anicut was built during this period. Large-scale construction of tanks (Tataka) for tapping rain water was also done in Tamil Nadu. The Chola period (985-1205 A.D.) witnessed the introduction of quite advanced irrigation systems, which brought about prosperity in the Deccan region. This included not only weirs across rivers and streams but also chaintanks i.e. a number of tanks with connecting channels. This new system was more reliable in terms of water availability and provided better flexibility in water distribution. In the Medieval period, Mohammad Bin Tughlaq (1325-1351 A.D.) encouraged the farmers to build their own rain water harvesting systems and wells. The Vijaynagar Kingdom (1336-1546 A.D.) in the south took keen interest in building rain water harvesting structures in the form of large and small storage tanks.

Method of Construction

Indian engineers gave the much attention to the location of reservoirs or lakes. They didn't suggest the King to construct the reservoirs in all over places. There was some tact to choose the place for the construction. That place should be in between two mountains or surrounded by the mountains. This natural factor helps to save the wealth and human energy. Mountains give the natural embankments to the reservoir. Such embankments had much immunity power to bear direful floods. And such places helped to increase the storage capacity of reservoirs. In order to give the strength to the reservoirs or tanks, trees were also planted at surrounding of its embankments. These trees helped in preventing the soil erosion from the sudden and direful floods. Usually fruit y\trees were planted. In the Tamil country five fruit bearing trees, the Indian gull-nut, Nelli, Tanri, Karanja-punga and Aswatta were generally planted. The places without such natural arrangements were caused to expensive and waste of time and energy. The Chitramegha Tataka, which was constructed by the

Mahendravarman I is situated in between two hills. The Rammappa lake, which was constructed during the reign of Ganapatideva of Kakatiya ruler of Warrangalis surrounded by three hills. In order to providing irrigation facility and supply the water to the city of Nagalapura the great king of Vijayanagar Empire Krishnadeva Raya constructed the Nagalapura tank. In the chronicles of Paes, it is stated that “The tank is at the mouth of two hills so that all the water that comes from either one side or other collects there”.

Construction Agencies

Some agencies were took the responsibilities of constructing the tanks, ponds, reservoirs, wells etc. The State was the main responsible to construct the water storages it was its duty also. But the other agencies were also worked as a parallel institution of the State regarding the construction of the water storages. Such agencies are the village communities, private individuals and temple committees.

Generally the State was serves as a main agency in the construction of

water storages. It was a duty of the king also. In order to get more land tax, which was levied on its productivity he had to be construct the tanks. And the State imposed irrigation tax also. Storages were constructed in the rule of every dynasties, and some kings repaired the old tanks or reservoirs when those were destroyed by natural calamities or destruction made deliberately. The kings were gave land grants to construct the tanks. For example the Kadamba ruler Jayasimhadeva donated land to construct a tank in Sabbinadu (in 1041 AD)

Village communities served as an agency of water storage construction in their villages for their self-sufficiency. Those communities constructed tanks in order to cultivate the land in summer season also and for drinking water. From the records of Rajarajadeva III we knew that, the members of the Samvatsara-gramakarya of that village were digged a sacred tank to the temple of Tirutturaipundi-Udaiyar. During the reign of Kulottunga Rajendrachola II of

Velanadu the assembly of the Ranki Chief constructed a number of tanks.

Some respected and wealthy persons also constructed tanks individually in their own name or their dearest. The unselfish endeavours of such person are admirable forever. They had spent their own money or wealth to the construction of the tanks. Desiseti, a merchant constructed two tanks in the name of his son. Those are named as Kallanakere and Mavinakere. In the construction water storages temples also took prominent portion. But the temples never worked directly in the construction. They behaved as feudal lord in this context. They were paid the cost of construction and other grants to individuals to construct the tanks or ponds. The temple committee ceded the land in the name of Inam to construct a tank.

Modern Approach for Sustainability of Water Harvesting Programme

At present most water harvesting structures are built under the holistic programme of watershed development which addresses the following main concerns/issues:

- i. Roof top rainwater harvesting for domestic use of individual households and small communities in remote areas.
- ii. Creating surface water storages in the form of check dams, dug ponds etc. for irrigation and drinking water for cattle.
- iii. Recharging ground water through check dams, percolation tanks, sub-surface dykes etc. to augment drinking water availability in wells, tube wells, hand pumps etc.
- iv. Soil conservation through; A forestation, Gully plugging, Contour cropping, Control and regulation of grazing
- v. Soil moisture conservation especially in rainfed hilly areas, through Bench terracing, Contour bunding
- vi. Improving cropping pattern, crop calender etc. for enhancing farm incomes
- vii. Improving marketing facilities for farm produce
- viii. Providing additional livelihood options such as: Dairy farming, Poultry farming, Bee keeping, Sericulture etc.,

ix. Promoting social forestry to meet the fuel wood requirement where alternative sources of fuel are not feasible. The watershed development and management programme is carried out from concept of commissioning with whole hearted participation of beneficiary communities for which detailed guidelines have been issued by the Government of India The benefits of watershed development schemes are evaluated in terms of;

- i. Increase in discharge of local streams and rejuvenation defunct local streams
- ii. Increase in water availability in village wells, hand pumps etc.
- iii. Increase in biomass
- iv. Increase in rain fed area and irrigated area
- v. Increase in productivity of rain fed and irrigated areas
- vi. Reclamation of degraded lands
- vii. Improvement in socio-economic condition of people especially women

Role of Communities and Individuals for conserve to water

In those days, centuries ago, the state built only large storages essentially for irrigation and water supply for the capital cities and important towns. These were obviously

not enough and therefore the village communities and individuals were encouraged to build their own water harvesting devices to meet their basic domestic requirement of water. The communities being closely knit had a strong culture of providing voluntary labour and material contributions for building these facilities for the common good. The social norms for civilized behaviour, interalia, enjoined on the community members to maintain these facilities, conserve and protect water from pollution and ensure its equitable and fair distribution.

Conclusion

The present paper reveals that how to construct and how to choose the places for the construction of water storages. During the ancient period the engineers had been selected the places, which were arranged by natural mounds or hills. Undoubtedly the reservoirs or tanks were founded for the public welfare. As a part of duty the State had took main portion in the construction of water storages. From those Reservoirs State had got much benefit by imposing irrigation tax.

Some unselfish persons were also constructed the tanks in their own expenditure for the public good. Village communities and temple committees were also took responsibility in this action. The reservoirs and tanks were very helpful to cultivate dry land, and for drinking as well as home use. The methods of the construction of the reservoirs were very intellectual. The plan of construction and strengthening the embankments of the tanks or reservoirs were very excellent. They used scientific methods systematically in the construction, like using natural arrangement places and planting particular trees at the surrounding of the embankments in order to give much strength to the reservoirs. Rainwater harvesting as part of the broad based watershed development programme is useful in augmenting water availability for domestic use and agriculture in diverse geo-climatic conditions, reclamation of degraded lands, increasing biomass rejuvenating defunct local streams, providing additional livelihood options etc. thereby improving the socio-economic

condition of the people with environmental safeguards. Recharging of groundwater with rainwater harvested from roof tops in urban areas an important measure to address the problem of declining ground water levels.

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